2018 Systems of Signals Generating and Processing in the Field of on Board Communications, 2018, vol.2018-January, pages 1-7

Practical aspects of increasing the spectral efficiency of PSK-n-signals due to intersymbol symbol interference

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2018 IEEE. The paper considers some practical aspects arising from the use of 'transparency windows' (range of symbol time durations of information sequence when error probability per symbol due to intersymbol distortion is zero) to increase spectral efficiency in radio communication systems using multiposition phase-shift keyed signals with n discrete states. The functioning of communication systems was analyzed in the presence of frequency detuning and error produced by phase meter for various amplitude-frequency responses of a linear radio path. The admissible operating conditions and gains in information transfer rate of such systems are determined.

http://dx.doi.org/10.1109/SOSG.2018.8350614

Keywords

gain in information rate, ISI, PSK-n-signals, spectral efficiency

References

[1] I.M. Lerner, "Method for capacity estimation of real communicational channels with psk-n-signals in presence of ISI and its application", TComm, vol. 11, no. 8, pp. 52-58, 2017

[2] I.M. Lerner, "Analytical estimation of capacity of the communicational channel with the frequency response of the resonance filter in the presence of ISI and the use of PSK-n-signal", T-Comm, vol. 11, no. 9, pp. 65-73, 2017

[3] I.M. Lerner, N.N. Kamalletdinov, "To a question of increasing the data transmission rate of phase radio-technical data transmission systems operating under strong intersymbol interference in linear radio path", H&ES Research, vol. 9. no. 5. pp. 92-104, 2017.

[4] A.E. Mordvinov, "Issledovanie vozmozhnosti povysheniya chastotnoj ehffektivnosti linij svyazi za schet ispol'zovaniya signalov s vzaimnoj interferenciej simvolov" (Study of possibility to increase frequency efficiency of communication links by using signals with mutual symbol interference"), Ph.D. dissertation, MPEI, Moscow, Russia, 2009. [in Russian]

[5] J. G. Proakis, Digital Communications, N.Y.: McGraw-Hill, 2001, 928 p.

[6] I.M. Lerner, R.R. Fayzullin, S.M. Chernyavskii, "To a question of increasing the spectral efficiency of phase radio-technical data transmission systems operating under strong intersymbol interference", Russian Aeronautics, 2018, in press.

[7] S.I. Evtyanov, Perekhodnye processy v priemno-usilitelnyh skhemah (Transient Responses in Receiver-Amplifier Circuits). M.: Svyazizdat, 1948, p. 221. [in Russian]